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APPLICATION NUMBER	FILED DATE	FIRST NAMED APPLICANT	ATTY. SCKET NO.
08/672,128	06/27/96	AD	M DR-6976
			EXAMINER

12M2/0328
PHILIP M. PIPPENGER
PATENT AND TRADEMARK DIVISION
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VOL. AND ART. NO.	PAPER NUMBER
	6

1204
DATE MAILED: 03/28/97

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

- ☐ Responsive to communication(s) filed on _____
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-48 is/are pending in the application.
Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-48 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☐ Notice of Reference Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 4
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

SEE OFFICE ACTION ON THE FOLLOWING PAGES

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 1-48 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claims read on a process in which “separating 4,5-benzoindanol from ether and water by extracting the quenched reaction mixture with a liquid hydrocarbon havin a higher boiling point or a higher initial boiling point than the ether, and distilling at least the ether from the resultant extract”. This limitation in the claims reads on a process where either the ether(s), or the ether(s) and the 4,5 benzoindanol, or the ether(s) and the hydrocarbon, or the ether(s) and the 4,5 benzoindanol and the hydrocarbon can be distilled from the the resultant extract. The specification only enables a process that includes “distilling off said ether and , if present, the alcohol to leave a liquid hydrocarbon solution of the 4,5-benzoindanol” (page 6, lines 24 and 25).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over US patent

4,528,408 to Plummer, in view of "Organic Chemistry" by Morrison and Boyd, in view of EP 549,900 to Rohrmann (English equivalent is US 5,455,366), in view of EP 659,757 to Winter in further view of CA 2,084,017 to Rohrmann.

4. Plummer discloses a process according to the instant claims where a ketone is reacted with a reducing agent, an ether and a source of hydrogen to produce the corresponding alcohol. Plummer further discloses the use of lithium aluminum hydride as the reducing agent, THF as the ether in the reaction mixture and water as a source of hydrogen or OH containing compound (col 6, lines 56-64). Plummer does not disclose the use of sodium borohydride as the reducing agent. Plummer's process also differs from the instant process in the use of a specific ketone. Plummer discloses a 2,3-disubstituted indanone (col 6, line 36) whereas the instant invention uses a 2-substituted-4,5-benzoindanone. Rohrmann discloses a process where a 2-substituted-4,5-benzoindanone is reduced to the corresponding alcohol using an inert solvent such as THF or diethylether and a reducing agent of such as lithium aluminum hydride or sodium borohydride (pg 9 lines 12-13). Morrison and Boyd in their textbook "Organic Chemistry" (page 630) teach that after reduction of a ketone by either lithium aluminum hydride or sodium borohydride there should be a source of hydrogen to produce the alcohol and that one source can be water. It would be obvious to anyone skilled in the art at the time of the instant invention to use the 2-

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substituted-4,5-benzoindanone of Rohrmann in place of the substituted indanone of the Plummer's process since both compounds are cyclic ketones. It would further be obvious to anyone skilled in the art in view of Morrison and Boyd to use sodium borohydride in place of lithium aluminum hydride as the reducing agent in the Plummer's process. Rohrmann (line 6, page 11) discloses the use of catalytic arylsulfonic acid namely p-toluene sulfonic acid to cause the formation of a 4,5-benzoindene (schematic diagram on page 9). Rohrmann (pg 13 line 8-9) also discloses the use of separating the ether and the water from the reaction prior to catalytic dehydration. Rohrmann does not disclose the use of the 2-substituted-4,5-benzoindanol since his starting material is the 2-substituted-4,5-benzoindanone but he performs a two step process in one pot in which he first reacts the 2-substituted-4,5-benzoindanone with a reducing agent obtaining an oil and then uses the arylsulfonic acid with this oil intermediate to form the benzoindene. Plummer and Morrison and Boyd have shown that the result of reacting a ketone with sodium borohydride is to form an alcohol so it is obvious to anyone skilled in the art that Rohrmann (schematic diagram on pg 8) first formed the 2-substituted-4,5-benzoindanol which is the oil intermediate and then dehydrated the alcohol (oil) with an arylsulfonic acid to form the benzoindene in a two step one pot reaction. Rohrmann (pg 8 schematic diagram (H)) discloses a process with the use of a strong base, an alkyl lithium, to deprotonate the 4,5-benzoindene, and the subsequent reaction with a diorgano dihalo silicon, germanium, or tin compound to form complex with the 4,5-benzoindene. Rohrmann-017 does disclose that the diorgano portion of the silicon, germanium or tin can be a hydrocarbyl group with up to 40 carbons and a

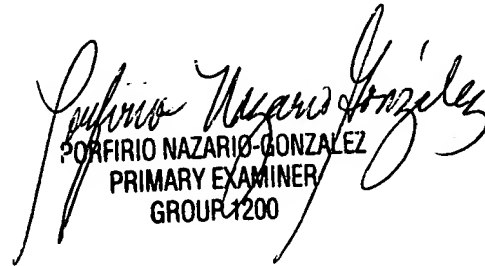
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hydrocarbyl(oxyalkylene) up to 10 carbons. Rohrmann-017 does not disclose that the diorgano portion of the silicon, germanium, or tin be a oxyalkylene group containing up to 100 carbon atoms. However one skilled in the art at the time of the instant invention would know that one could increase the number of carbon atoms in an oxyalkylene group to make a longer chain. Rohrmann-017 does not disclose separating the solids from the liquid phase by filtration, centrifugation, or decanting however it would be obvious to anyone skilled in the art to use these techniques as they are inherent in the art. Rohrmann-017 does not disclose the use of a lower dialkyl ether. Winter discloses (pg 14, line 25) the reaction of a 2 alkyl-4,5-benzoindene deprotonated by a strong base, alkyl lithium, in a mixture of toluene and diethyl ether reacting with a dialkyl dihalo silicon to form a bridged complex. It would have been obvious to anyone skilled in the art that if the lower dialkylether, diethyl ether, could be used as part of the solvent for the reaction as disclosed by Winter and Rohrmann-017 teaches that the reaction can take place in a one solvent ether, THF, that the THF could be replaced in the reaction by diethyl ether. It would be obvious to anyone skilled in the art at the time of the instant invention to combine all the above references, since they are all steps in the formation of a metallocene complex, with the expectation of obtaining the desired final product.

5. Inclusion of language showing that the 4,5-benzoindanol remains in the hydrocarbon solution after distillation will make the claims allowable over the prior art of record.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean F. Vollano whose telephone number is (703) 305-4483. The examiner can normally be reached on Monday - Friday from 6:30 to 3:00.
7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Geist, can be reached on (703) 308-1701. The fax phone number for this Group is (703) 308-4556.


PORFIRIO NAZARIO-GONZALEZ
PRIMARY EXAMINER
GROUP 1200

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